BRYOPHYTES OF THE MT. GREYLOCK REGION,— II.

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The observations of another summer upon the bryophytes of the Mt. Greylock region go far to swell its list and clear up some of the obscurities concerning its less common species. More extensive notes upon habit and habitat of these will perhaps not be unwelcome, as bearing, in some slight degree, upon problems of distribution and environment. The species differ, of course, with altitude, and on lower slopes with direction of exposure.

It is possible to distinguish, roughly, three vegetative belts: lower altitudes, from base to perhaps 2200 feet, middle altitudes, from 2200 to 2800, and higher altitudes, from 2800 to 3500 feet, the summit. For the areas that my collections cover, the mountain slopes westwardly into New Ashford, west and northwest into Williamstown, north and northeast into North Adams. A large gorge in Williamstown very near the New Ashford line is known as Goodell Hollow. Farther north in Williamstown an immense, very deep, and composite gorge is not unfittingly termed the Hopper. The configuration of this last feature becomes noticeable even near the summit of the mountain, and, as might be expected, the species of northern range are to be sought here. My exertions of the past summer were largely confined to these gorges and the summit region. Results, as will be seen, were most noticeable in the genera Amblystegium and Hypnum, while the sphagna proved more diversified and interesting than I had anticipated.

The nomenclature used is again, as far as possible, that of the Manuals. In Amblystegium the monograph of Prof. Cheney in Botanical Gazette (XXIV, 236, ff.) has been consulted. Comparison has also been made in many cases with the figures in Sullivant's Icones, in Braithwaite's British Moss-flora, etc. The species follow:

MUSCI.

Amblystegium adnatum, (Hedw.) Aust. On rock in woods, lower slopes of Hopper. The species, which is not uncommon in the vicinity, has a distinct preference for limestone.

Amblystegium chrysophyllum, (Brid.) De Not. (*Hypnum chrysophyl-*

lum, Brid.). Moist ground about base of mountain in New Ashford and Williamstown.

Amblystegium compactum, (C. M.) Aust. Decayed spot in tree, Hopper. This is a species of northern range, occurring in New Brunswick, Ontario, British Columbia, and the Rocky Mountain region. Cheney also records it from New York, Pennsylvania, and Wisconsin. It has not before been reported from New England. It is readily distinguished by its serrate leaves and nearly erect capsule, running down into a narrow collum. I first found it about a large knot hole on a maple tree in the very centre of Williamstown village, where it was associated with *Leskea polycarpa*, Ehrh. and *Anacamptodon splachnoides*, (Froehl.) Brid., both uncommon species, the latter particularly so.

Amblystegium hispidulum, (Brid.) Grout. (*Hypnum hispidulum*, Brid.) About base of trees in woods. Lower slopes, New Ashford.

Amblystegium irriguum, (Wils.) Br. & Sch. Stones and ground about brooks. Lower altitudes in Williamstown and North Adams.

Amblystegium serpens, (Hedw.) Br. & Sch. Moist ground, lower slopes in Goodell Hollow. Not common.

Anomodon rostratus, (Hedw.) Sch. Moist rocks, near base in New Ashford.

Buxbaumia indusiata, Brid. I am indebted to Dr. G. N. Best for the identification of this specimen, as also for information with regard to its occurrence in New England. The only reference to such occurrence is a statement in Jaeger's Adumbratio to the effect that it was collected in the White Mountains by Oakes and distributed, mixed with *B. aphylla*, L. by Sullivant. Since it became known to American bryologists in 1890, it has been found in Idaho, Washington, and in the Catskill and Adirondack regions and about Ithaca, New York, but not hitherto in New England. It is generally a native of mountain regions and even where found is less abundant than the commoner *B. aphylla*. I was unable to find more than the one specimen, which was growing from a decayed spruce log at middle altitude.

Climacium Americanum, Brid. Damp ground in Hopper. Leaves from different parts of the same plant showed very different areolation, it being in some cases typical, in others very short, approaching that of var. *Kindbergii*, R. & C., though the plants were all dendroid.

Cylindrothecium cladorhizans, (Hedw.) Sch. Decayed stump near base of mountain in New Ashford.

Cylindrothecium seductrix, (Hedw.) Sull. About rocks on "Bluffs," middle altitude.

Dicranum flagellare, Hedw. On decayed wood at lower altitudes. Goodell Hollow.

Dicranum fulvum, Hook. Rocks in woods. Middle and lower altitudes in Hopper.

Dicranum scoparium pallidum, L. & J. On ground, lower slopes, Goodell Hollow. This variety, as it occurs here, is generally found in drier, more open places than typical *D. scoparium.*

Dicranum scoparium. A form or variety quite distinct, with long, robust stems, long, acuminate leaves, and very long capsules, sulcate when dry. On wet ground in deep woods, lower slopes, Goodell Hollow. Dr. True recognizes the form as one which he finds in the White Mountains under similar conditions.

Ditrichum vaginans, (Sull.) Hpe. Dr. Best kindly identified this species, which had considerably puzzled me. It occurs beside the carriage road, near the summit, where it is frequently mixed with *Pogonatum capillare.* Dr. Grout, I notice, in his Mosses with a Hand-lens, treats it as a plant of southern range in New England. Its occurrence at such an altitude, mixed with a plant of such northern range as *P. capillare*, would suggest the probability that it follows its congener, *D. tortile.* As bearing upon the contention of Austin and Lesquereux about the peristome, it may be interesting to note that the teeth of these specimens were decidedly papillose, supporting Austin's minority view. Limpricht in Die Laubmoose states that they are sometimes slightly papillose.

Eurhynchium strigosum, (Hoffm.) Br. & Sch. On ground and stones about brooks at various altitudes. Infrequent or not commonly fruiting.

Fissidens taxifolius, (L.) Hedw. On wet ground near the base, in New Ashford.

Grimmia apocarpa, (L.) Hedw. On rocks in brooks, Goodell Hollow, and wet rock in woods, Hopper.

Hylocomium umbratum, (Ehrh.) Br. & Sch. Thickly carpeting rocks and earth, near summit. Sparingly fruited.

Hypnum cupressiforme, L. Generally on bark of trees or logs. Lower altitudes, Goodell Hollow.

Hypnum curvifolium, Hedw. On wet rocks which receive a wash of decayed vegetable matter. Base of mountain in Goodell Hollow.

Hypnum dilatatum, Wils. On rocks in brook, middle altitude. Unfruited.

Hypnum eugyrium, Sch. On rock by brook, lower altitude, Goodell Hollow.

Hypnum Haldanianum, Grev. Earth, decaying vegetable matter, etc. Middle and mostly higher altitudes.

Hypnum imponens, Hedw. Decaying logs, generally in lower altitudes. Nowhere in great abundance.

Hypnum reptile, Rich. (*H. pallescens*, (Hedw.) Beauv.) Very abundant at all altitudes, on bark of trees, decaying logs, stumps, etc. More robust and pale in color toward summit.

Plagiothecium silvaticum, (Huds.) Br. & Sch. On ground and decaying wood at lower altitudes, in Goodell Hollow. Of the three Plagiotheciums occurring on the mountain, this species seems to prefer lower altitudes, *P. turfaceum* middle and *P. denticulatum* generally the higher. There is a noticeable difference in the time of ripening of capsule, the order being that of the length of the operculum, beginning with the shortest: *P. turfaceum*, *P. denticulatum*, *P. silvaticum*.

Pogonatum capillare, (Rich.) Brid. Mrs. A. M. Smith has called attention to the presence of this species (RHODORA, April, 1902). In New England it is a species of the highest alpine mountain summits, adding one more to the very limited alpine flora of Greylock.

Racomitrium Sudeticum, (Funck.) Br. & Sch. Mr. J. M. Holzinger kindly determined this species, which was unfruited. It grew upon the horizontal surface of a rock, near the summit, only the one small tuft being seen. The leaves are unusual in mostly lacking a hyaline point. It is another species of northern or high mountain range, and is probably new to Massachusetts, though occurring in the high mountains of the northern New England States.

Raphidostegium recurvans, (Schwaegr.) Jaeg. Very abundant about bases of trees and on decaying wood, at middle and higher altitudes. When sterile simulating the Hypnums.

Rhyncostegium rusciforme, (Weis) Br. & Sch. On rocks in brooks, at various, especially middle, altitudes.

Sphagnum cuspidatum, Ehrh. In wet spot near summit.

Sphagnum medium, Limpr. Low-growing, purplish form in similar places.

Sphagnum recurvum, Beauv. (*S. intermedium*, Hoffm. of Manual.) In similar situations.

Sphagnum rigidum, Sch. In similar situations.

Sphagnum tenerum, (Aust.) Warnst. In similar, more open place.

Distinguished from the closely-related *S. acutifolium* by the involute-pointed stem leaves, fibrillose throughout, with divided utricles, and the narrow pores of the backs of leaves. Hitherto reported only from New Jersey and Connecticut.

Thuidium scitum, (Beauv.) Aust. Stones and base of trees in woods, near base in New Ashford.

HEPATICAE.

Aneura latifrons, Lindb. On decayed logs at middle altitude.

Cephalozia curvifolia, Dumort. Rather common on decayed wood at various altitudes. Most abundant and well-fruited at middle altitude with last.

Cephalozia divaricata, Dumort. This species was found in clefts of dry rock at base of mountain, in Hopper.

Cephalozia multiflora, Spruce. On decayed wood at various altitudes. Especially common about the summit, where it occurs mixed with other hepatics and mosses, and generally sterile.

Frullania aeolotis, Nees. (*F. riparia*, Hpe.) Bark of tree in Hopper, also on rock in woods of lower slope.

Jungermannia incisa, Schrad. On ground near summit.

Jungermannia Schraderi, Martius. On decayed logs at middle altitudes, with *Cephalozia curvifolia*.

Jungermannia ventricosa, Dicks. With *Dicranum fuscescens* on decayed stumps, just below the summit. The masses of minute bodies borne on the tips of the leaves gave the mat of plants a quite characteristic glaucous-green appearance.

Marsupella emarginata, Dumort. On wet rocks, frequently in brook-beds, at higher altitudes.

Radula complanata, Dumort. On rocks and earth at base of mountain in New Ashford, Williamstown, and North Adams.

Scapania nemorosa, Dumort. On ground and rocks at upper altitudes. The more or less erect plants generally bear dark gemmae at the apex.

Trichocolea tomentella, Dumort. About base of tree in very wet woods, middle altitude.

All of the above mentioned species are represented by herbarium specimens, which are at present with the Herbarium of Williams College in Williamstown.

CAMBRIDGE, MASSACHUSETTS.

REMARKABLE PERSISTENCE OF THE BUTTON-BUSH.

WALTER DEANE.

IT seems a strange and anomalous condition of things, a perversion of the laws that govern the distribution of plants, to see our common Button-bush (*Cephalanthus occidentalis*, L.) growing in a dry hen-yard behind a barn. Yet such is the case and the shrubs flourish from year to year in this quaint spot, though their natural habitat is swamps and the wet borders of ponds and streams. The story is an interesting one and illustrates well the dogged persistence that some plants show in the hard struggle for life.

The scene is in Shelburne, New Hampshire, on the farm of Mr. A. E. Philbrook. On one part of this farm, as early as 1860, there stood a small pond on whose borders grew in greater or less abundance the Button-bush. The water was shallow and muddy, and in summer the pond was reduced to a very swampy piece of land. Between 1860 and 1865, the owner of the land, in order to make a suitable site for a barn, decided to fill up the pond. To lighten this task a small neighboring stream was turned so as to flow along the foot of a sandy hill close by the pond. The water undermining the bank brought down a good supply of sand, and the pond was finally filled, the level of the ground being about three feet above the former surface of the water. The Button-bush was buried out of sight, for whatever may have been above ground was cut off or trampled down, and on this new land the barn was built and an area left in the rear was used as a wood-yard. Soon sprouts of the buried plants began to appear, but they were continually cut off or trodden under foot until finally the place was turned into a hen-yard and fenced in. Not long after this, the sprouts again appeared and ere long the plants were of normal size, in good condition, and flowering and fruiting regularly, though the roots were buried at least three feet deeper